

Name Key

Date _____

Complete the following chart for regular polygons.

	#1	#2	#3	#4	#5	#6	#7	#8
Each interior \angle	150°	120°	156°	160°	170°	174°	172°	$176\frac{1}{4}^\circ$
Each exterior \angle	30	60	24	20	10°	6°	8°	3.75°
Interior \angle sum	1800	720	2340	2880	6120	10440	7740	16,920
Exterior \angle sum	360	360	360	360	360	360	360	360
N # of sides	12	6	15	18	36	60	45	96

Find the sum of the measures of the interior angles of each convex polygon.

1. 10-gon 1440 2. 16-gon 2520 3. 30-gon 5040

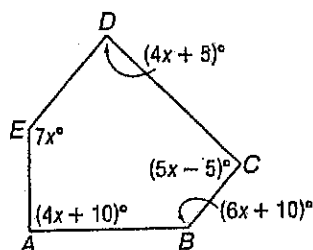
4. 8-gon 1080 5. 12-gon 1800 6. 3x-gon $(3x-2)180$
 $540x - 360$

The measure of an interior angle of a regular polygon is given. Find the number of sides in each polygon.

7. $150 \frac{360}{36}$ 12 8. $160 \frac{360}{20}$ 18 9. $175 \frac{360}{5}$ 72

10. $165 \frac{360}{15}$ 24 11. $168.75 \frac{360}{11.25}$ 32 12. $135 \frac{360}{45}$ 8

13. Find x .



$$\begin{aligned}
 26x + 20 &= 540 \\
 26x &= 520 \\
 x &= 20
 \end{aligned}$$

8-1

Skills/Practice

Angles of Polygons

Find the sum of the measures of the interior angles of each convex polygon.

1. nonagon

$$(9-2)180$$

$$1260$$

2. heptagon

$$(7-2)180$$

$$900$$

3. decagon

$$(10-2)180$$

$$1440$$

The measure of an interior angle of a regular polygon is given. Find the number of sides in each polygon.

4. 108

$$\frac{180}{72} = 2.5$$

$$\frac{360}{72} = 5$$

5. 120

$$\frac{180}{60} = 3$$

$$\frac{360}{60} = 6$$

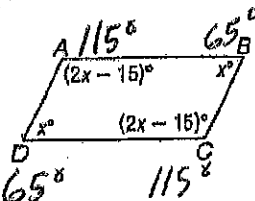
6. 150

$$\frac{180}{30} = 6$$

$$\frac{360}{30} = 12$$

Find the measure of each interior angle using the given information.

7.



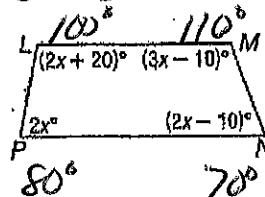
$$2x - 15 + 2x - 15 + x + x = 360$$

$$6x - 30 = 360$$

$$6x = 390$$

$$x = 65$$

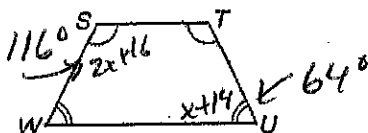
8.



$$2x + 20 + 2x + 20 + 3x - 10 + 3x - 10 = 360$$

$$9x = 360$$

$$x = 40$$

9. quadrilateral STUW with $\angle S \cong \angle T$, $\angle U \cong \angle W$, $m\angle S = 2x + 16$, $m\angle U = x + 14$ 

$$2(2x+16) + 2(x+14) = 360$$

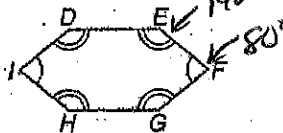
$$4x + 32 + 2x + 28 = 360$$

$$6x + 60 = 360$$

$$6x = 300$$

$$x = 50$$

10. hexagon DEFGHI with

 $\angle D \cong \angle E \cong \angle G \cong \angle H$, $\angle F \cong \angle I$, $m\angle D = 7x$, $m\angle F = 4x$ 

$$4(7x) + 2(4x) = 720$$

$$28x + 8x = 720$$

$$36x = 720$$

$$x = 20$$

Find the measures of an interior angle and an exterior angle for each regular polygon.

11. quadrilateral

$$\frac{360}{4} = 90$$

$$180 - 90 = 90$$

12. pentagon

$$\frac{360}{5} = 72$$

$$180 - 72 = 108$$

13. dodecagon

$$\frac{360}{12} = 30$$

$$180 - 30 = 150$$

Find the measures of an interior angle and an exterior angle given the number of sides of each regular polygon. Round to the nearest tenth if necessary.

14. 8

$$\frac{360}{8} = 45$$

$$180 - 45 = 135$$

$$15. 9 \quad \frac{360}{9} = 40$$

$$180 - 40 = 140$$

$$16. 13 \quad \frac{360}{13} \approx 27.7$$

$$180 - 27.7 \approx 152.3$$